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**XIV**

**A NEW SPECIES OF WHALE FROM THE TYPE  
LOCALITY OF THE MONTEREY GROUP**

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In November, 1923, during the excavation for the foundation of a plant for the manufacture of insulation from diatomaceous earth near Monterey, California, Mr. C. A. Ryan, President of the Monterey Products Company, noticed that the workmen were encountering the bones of a whale. Although some damage had then been done, greater care exercised thereafter enabled him to extract the skull in fairly complete condition. It is through his interest in science that the specimen was donated to the California Academy of Sciences.

The location of the plant, and, therefore, the type locality of the whale, is just to the south of the road from Salinas to Monterey, and about five miles east of the latter town. The property forms a part of the old Saucito Rancho.

This is the region of the type locality of the Monterey Group of the Miocene, and, for this reason, the whale is of particular importance. Unfortunately, the skull only was unearthed, but Mr. Ryan was of the opinion that the remainder of the skeleton was in place.

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The strata of the exposure dip to the westward at an angle of about  $45^{\circ}$ , and the strike is northeast. The buildings are erected at the base of a steep incline on the west side of a creek, the slope being composed of diatomaceous earth. The top stratum is loose and scarcely consolidated, characters which accompany the upper part of the Monterey shale member wherever definitely exposed. At this point it is approximately 50 feet thick. Below this loose, purer grade of material, there is exposed about 75 feet of thinly bedded, more consolidated earth with occasionally some "opalized" or "flinty" shale.

The skull was embedded in soft material and was, therefore, easy to prepare. It had been slightly crushed in the palatine region and on the dorsal side, but so little was this that the pieces readily came together again in their natural position. In the deeper recesses and cavities of the skull, the siliceous material had become cherty and was difficult to remove. This effectually prevented the removal of the periotic bones.

*Balænoptera ryani* Hanna & McLellan, new species

(Plates 5 to 9)

*Type*: No. 1733, Mus. Calif. Acad. Sci. (Dept. Paleo. Type Coll.), collected by C. A. Ryan, five miles east of Monterey, California, November, 1923.

*Horizon*: Type locality of Monterey Group, Miocene.

*Description*: Occipitals fused, their limits indeterminate posteriorly. Foramen magnum nearly circular, plane of its orbit decidedly dorsal. Condyles broad (horizontal diameter about three-fourths vertical diameter), pitted, strongly convex dorso-ventrally, depressed transversely, only slightly elevated above surrounding areas laterally, and defined by a clearly characterized ridge; lateral margins strongly convex, mesal margins nearly straight; separated dorsally by nearly the diameter of foramen magnum and ventrally by a deep, narrow channel. Supraoccipital forming dorsal shield and extending far forward; roughly triangular in outline, broad basally, apically constricted, width at apex approximately

one-sixth length, median width nearly four-fifths length; deeply concave anteriorly; longitudinal ridge obsolete caudally, becoming more evident towards rostrum. Squamosals greatly thickened antero-posteriorly; squamous portion apparently not entering into dorsal surface, meeting supraoccipital at superior margins of temporal fossæ; anterior margins crescentic in outline, antero-external divisions of falcate processes limited by lateral walls of the pterygoids, and extended mesally to form part of outer walls of pterygoid fossæ; well defined groove extending upward and outward from region of sphenoidal fissures. Parietals forming nearly entire walls of temporal fossæ, deeply concave mesally, superior margins extended laterally to join inferior edges of supraoccipital; apparently overlying frontals to slight extent on vertex; broadly rounded posteriorly, contiguous with articular processes of squamosals. Alisphenoids apparently small, interposed between parietals and pterygoids. Orbital processes of frontals horizontal, and at a level much lower than vertex. Vomer projecting between, below, and posterior to, palatines; ventral margin swollen and keeled; thin vertical plate thickening rostrally; horizontal plates extending laterally from superior margin to meet ascending wings of palatines and internal walls of pterygoids, and caudally to overlie basisphenoid. Palatines broad, diagonal ridges irregularly separating horizontal and vertical surfaces; posterior margins (considered together) obomegoid in outline. Pterygoids well developed, externally interposed between squamosals and palatines, and extending upward to sphenoidal fissures; inclosing deep pterygoid (scaphoid)<sup>1</sup> fossæ, opening in the direction of, and ventral to, tympanic cavity; roofs of fossæ sloping strongly upward; hamular processes large, rounded at proximal extremities, slightly convergent and somewhat inclined dorsally. Basioccipital rather broad, concave; swollen portions of lateral margins uniting with inner walls of pterygoids to form internal walls of tympanic cavities. Tympanic cavities bounded externally and posteriorly by squamosals and exoccipitals. Tympanic bullæ rounded posteriorly, keeled, and truncated at apex; inner

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<sup>1</sup> Ridewood, Phil. Trans. Roy. Soc. London, ser. B, vol. 211, pp. 263 *et seq.*

surface flattened, free margin very straight, longitudinal groove extending in proximity to keel; lips thickened, slightly sinuous, striated with vertical grooves, and with well marked Eustachian notches; external surfaces (damaged) showing little trace of deep transverse grooves. Periotics abutting on external walls of tympanic cavities, irregular in form; ventral apices directed forward and downward towards pterygoid fossæ.

## TABLE OF MEASUREMENTS

	Mm.
Length of supraoccipital from anterior margin of foramen magnum to apex .....	300.
Breadth of supraoccipital at apex (est.) .....	50.
Median breadth of supraoccipital (est.) .....	220.
Depth of concavity of supraoccipital .....	14.4
Width of foramen magnum .....	53.
Horizontal diameter of condyle .....	75.
Vertical diameter of condyle .....	101.
Length of left tympanic bulla (est.) .....	94.
Width of left tympanic bulla (est.) .....	52.
Width of basioccipital between tympano-periotic recesses.....	150.
Width of basioccipital at bases of descending processes.....	65.
Distance between extremities of hamular processes .....	96.
Depth of pterygoid fossa (to apex of hamular process).....	108.
Antero-posterior length of combined pterygoid and tympano-periotic recesses .....	147.5
Greatest dorso-ventral depth of skull .....	268.
Dorso-ventral depth of skull from vertex to vomer (est.).....	155.
Breadth of palatines at base of proximal margin of orbital process of frontal .....	185.

While bearing a superficial resemblance to many of the Balænopteridæ, *Balænoptera ryani* most closely approaches *B. acuto-rostrata* Lacépède and the doubtfully distinct *B. davidsoni* Scammon. Apparently, however, the new species is differentiated from its congeners, recent and fossil, by the marked lateral constriction in the region of the vertex, the short dorso-ventral depth of skull from vertex to vomer, the relative breadth of palatine region, the dorsal aspect of foramen magnum, and the distinctive form of the tympanic bullæ.

## EXPLANATION OF PLATES

## PLATE 5

Type skull of *Balænoptera ryani*, new species. About one-third natural size. Dorsal view. [In the process of engraving, part of the figure, showing the fragment of the right squamosal, was deleted from the plate. The actual extent of this portion of the skull may be seen in Plate VI.]

## PLATE 6

Type skull of *Balænoptera ryani*, new species. About one-third natural size. Ventral view.

## PLATE 7

Fig. 1. Right tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Superior view.

Fig. 2. Right tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Free border.

Fig. 3. Type skull of *Balænoptera ryani*, new species. About one-third natural size. Lateral view.

## PLATE 8

Fig. 1. Left tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Superior view.

Fig. 2. Right tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Free border.

Fig. 3. Right tympano-periotic bones of type skull of *Balænoptera ryani*, new species, in situ. About two-thirds natural size.

## PLATE 9

Fig. 1. Left tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Free border.

Fig. 2. Left tympanic bulla of type skull of *Balænoptera ryani*, new species. About natural size. Anterior view.

Fig. 3. Left tympano-periotic bones of type skull of *Balænoptera ryani*, new species, in situ. About nine-tenths natural size.

The same abbreviations are used on Plates 5 to 9 for the following parts: s.o., supraoccipital; b.o., basioccipital; e.o., exoccipital; o.c., occipital condyle; fr., frontal; p., parietal; pa., palatine; pt., pterygoid; pe., periotic; pt.f., pterygoid fossa; t.b., tympanic bulla; ha., hamular process; sq., squamosal; sq.g., squamosal groove; al., alisphenoid; vo., vomer; f.m., foramen magnum.